

WHAT IS CLAIMED IS:

1. A shell for an acoustic projector for use in sonar applications, comprising;
an openwork structure;
an outer layer on one side of said structure and adapted to provide the interface between said projector and the surrounding water; and,
an inner layer on a side of said structure opposite said one side and adapted to carry transducer drive elements thereat, whereby said projector is provided with an increased bandwidth over that associated with equivalent solid shells.
2. The shell of Claim 1, wherein said openwork structure is in the form of a honeycomb.
3. The shell of Claim 1, wherein said openwork structure is in the form of a series of co-located walled channels.
4. The shell of Claim 1 wherein said openwork structure is in the form of a truss.
5. The shell of Claim 1 wherein said openwork structure is in the form of an open lattice work.
6. The shell of Claim 5 wherein said open lattice work includes parallel spaced members at both said inner and outer layers, a number of spaced struts running between said parallel spaced

members in a direction octagonal thereto, and a number of stiffening struts, each running between a point of attachment between the parallel spaced members and said struts.

7. The shell of Claim 1 wherein said openwork structure provides a stiffness at least equal to that achievable with an equivalent solid structure.

8. The shell of Claim 1 wherein said projector is a slotted cylinder projector.

9. The shell of Claim 1 wherein said projector is a flextensional projector.

10. The shell of Claim 1 wherein said projector is an inverse flextensional projector.

11. The shell of Claim 1 wherein said projector is an oval-shaped projector.

12. A method of increasing the bandwidth of an acoustic projector for use in a wide variety of sonar applications comprising, providing an acoustic projector having an openwork shell, the shell having an openwork structure sandwiched between inner and outer layers.

13. The method of Claim 8 wherein the projector is a slotted cylinder projector.

14. The method of Claim 8 wherein the projector is a flextensional projector.

15. The method of Claim 8 wherein the projector is an inverted flextensional projector.

16. The method of Claim 8 wherein the projector is an oval-shaped projector.

17. A method of reducing the weight of an acoustic projector for sonar missions, while at the same time maintaining the acoustic properties of the projector comprising, providing a shell for the acoustic projector having an openwork structure sandwiched between inner and outer layers, whereby the weight of the projector is reduced without materially effecting the performance of the projector.